

AMENDMENTS TO THE CLAIMS

Please add or amend the claims to read as follows:

1. (Currently amended) An autonomous device configured for being capable of passing through a body lumen, the device for determining in vivo conditions, comprising:
 - at least one [[interaction chamber]] capillary for containing a sample, while in vivo, said [[interaction chamber]] capillary having at least one indicator therein for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;
 - at least one illumination source for illuminating the [[interaction chamber]] capillary; and
 - at least one optical detector for detecting optical changes occurring in the [[interaction chamber]] capillary.
2. (Currently amended) The autonomous device according to claim 1 wherein at least a portion of the [[interaction chamber]] capillary is transparent in the wavelength of illumination.
3. (Currently amended) The autonomous device according to claim 1 comprising a plurality of [[interaction chambers]] capillaries.
4. (Previously presented) The autonomous device according to claim 1 further comprising a micro pump for drawing the sample.
5. (Currently amended) The autonomous device according to claim 3 wherein one [[interaction chamber]] capillary comprises one indicator and another [[interaction chamber]] capillary comprises another indicator.

6. (Currently amended) The autonomous device according to claim 1 wherein the [[interaction chamber]] capillary is sealed by at least one membrane which selectively enables passage of a sample but does not enable passage of the indicator.
7. (Currently amended) The autonomous device according to claim 1 wherein the indicator is immobilized onto the [[interaction chamber]] capillary walls.
8. (Currently amended) The autonomous device according to claim 1 wherein the indicator is immobilized onto an appendage that is restricted to the [[interaction chamber]] capillary.
9. (Currently amended) The autonomous device according to claim 1 wherein the optical detector is an imager for obtaining images of the [[interaction chamber]] capillary.
10. (Previously presented) The autonomous device according to claim 9 further comprising a transmitter for transmitting the images.
11. (Previously presented) The autonomous device according to claim 10 further comprising a receiving system for receiving the images.
12. (Currently amended) The autonomous device according to claim 1 wherein the optical detector is an imager for obtaining images of a body lumen and of the [[interaction chamber]] capillary.
13. (Currently amended) The autonomous device according to claim 1 wherein the optical detector is an imager for obtaining images of a body lumen and of the [[interaction chamber]] capillary and for producing video signals thereof.
14. (Previously presented) The autonomous device according to claim 13 further comprising a transmitter for transmitting the video signals and a receiving system for receiving said video signals.

15. (Previously presented) The autonomous device according to claim 1 wherein the autonomous device is contained within or affixed onto a device that is designed for being inserted into a body lumen.
16. (Previously presented) The autonomous device according to claim 9 wherein the autonomous device is contained within or affixed onto a device designed for being inserted into a body lumen.
17. (Previously presented) The autonomous device according to claim 12 wherein the autonomous device is contained within or affixed onto a device designed for being inserted into a body lumen.
18. (Previously presented) The autonomous device according to claim 12 further comprising an optical system.
19. (Currently amended) A system for determining in vivo conditions, the system having at least two opposing ends and comprising:
 - two [[interaction chambers]] capillaries for containing a sample while in vivo, said [[interaction chambers]] capillaries each having at least one indicator therein for reacting with the sample for generating optical changes in said two [[interaction chambers]] capillaries;
 - at least one illumination source for illuminating said two [[interaction chambers]] capillaries; and
 - two image sensors for detecting optical changes occurring in said two [[interaction chambers]] capillaries and for obtaining in vivo images,wherein said two [[interaction chambers]] capillaries and the imagers are each positioned at an opposing end of the system.

20. (Previously presented) The system according to claim 19 further comprising a battery for providing power to elements of the system.

21. (Currently amended) An autonomous device configured for being capable of passing through a body lumen, the device for determining in vivo body lumen conditions and comprising:

at least one [[interaction chamber]] capillary for containing an endo-luminal sample in vivo, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the endo – luminal sample for generating optical changes in the [[interaction chamber]] capillary;

at least one illumination source for illuminating the body lumen and the [[interaction chamber]] capillary;

at least one imager for imaging the body lumen and for imaging the [[interaction chamber]] capillary.

22. (Currently amended) An autonomous device configured for being capable of passing through a body lumen, the device for determining in vivo GI tract conditions, comprising:

at least one [[interaction chamber]] capillary for containing a sample from the GI tract environment, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

at least one illumination source for illuminating the [[interaction chamber]] capillary;

at least one optical detector for detecting in vivo optical changes occurring in the [[interaction chamber]] capillary.

23. (Currently amended) An autonomous device configured for being capable of passing through a body lumen, the device for imaging the GI tract and for determining in vivo GI tract conditions, comprising:

at least one [[interaction chamber]] capillary for containing a sample from the GI tract environment, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

at least one illumination source for illuminating the GI tract and the [[interaction chamber]] capillary;

at least one imager for imaging the GI tract and for imaging the [[interaction chamber]] capillary and for producing video signals thereof.

24. (Original) A device according to claim 23 further comprising a transmitter for transmitting the video signals.

25. (Currently amended) An autonomous device configured for being capable of passing through a body lumen, said device for in vivo determining of GI tract conditions, the device comprising:

at least one [[interaction chamber]] capillary for containing a sample from the GI tract environment, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

at least one illumination source for illuminating the GI tract and the [[interaction chamber]] capillary; and

at least one imager for imaging the GI tract and for imaging the [[interaction chamber]] capillary.

26. (Original) A device according to claim 25 wherein the device is a swallowable capsule.
27. (Currently amended) A method for determining in vivo body lumen conditions, the method comprising the steps of:

receiving an endo – luminal sample in [[an interaction chamber]] a capillary that is configured in an autonomous device capable of passing through a body lumen, said [[interaction chamber]] capillary having at least one indicator therein for reacting with the endo – luminal sample for generating optical changes in the [[interaction chamber]] capillary;

illuminating the [[interaction chamber]] capillary; and

detecting optical changes occurring in the [[interaction chamber]] capillary.

28. (Currently amended) A method according to claim 27 wherein at least a portion of the [[interaction chamber]] capillary is transparent in the wavelength of illumination.
29. (Currently amended) A method according to claim 27 wherein the optical detector is an imager and the step of detecting the optical changes is a step of imaging the [[interaction chamber]] capillary.
30. (Currently amended) A method according to claim 29 further comprising the step of producing video signals of images of the [[interaction chamber]] capillary.
31. (Original) A method according to claim 30 further comprising the steps of transmitting the video signals to a receiving system and of receiving the video signals.

32. (Currently amended) A method for determining in vivo GI tract conditions, the method comprising the steps of:

receiving a sample from the GI tract in [[an interaction chamber]] a capillary that is configured in an autonomous device capable of passing through a body lumen, said [[interaction chamber]] capillary having at least one indicator therein for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

illuminating the [[interaction chamber]] capillary; and

detecting in vivo optical changes occurring in the [[interaction chamber]] capillary.

33. (Currently amended) A method according to claim 32 wherein the optical detector is an imager and the step of detecting the optical changes is a step of imaging the [[interaction chamber]] capillary and of producing video signals thereof.

34. (Original) A method according to claim 33 further comprising the steps of transmitting the video signals to a receiving system and of receiving the video signals.

35. (Currently amended) A method for imaging the GI tract and determining in vivo GI tract conditions, the method comprising:

receiving a sample from the GI tract in [[an interaction chamber]] a capillary that is configured in an autonomous device capable of passing through a body lumen, said [[interaction chamber]] capillary having at least one indicator therein for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

illuminating the [[interaction chamber]] capillary; and

imaging the GI tract and [[interaction chamber]] capillary and producing video signals thereof.

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36. (Original) A method according to claim 35 further comprising the steps of transmitting the video signals to a receiving system and of receiving the video signals.

37. (Currently amended) A method for determining in vivo GI tract conditions comprising the steps of:

receiving a sample from the GI tract in [[an interaction chamber]] a capillary that is configured in an autonomous device capable of passing through a body lumen, said [[interaction chamber]] capillary having at least one indicator therein for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary; illuminating the [[interaction chamber]] capillary; and imaging the GI tract and [[interaction chamber]] capillary.

38. (Currently amended) A capsule for imaging the GI tract and for determining in vivo GI tract conditions, comprising:

a system, said system comprising:

at least one [[interaction chamber]] capillary for containing a sample from the GI tract environment, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

at least one illumination source for illuminating the GI tract and the [[interaction chamber]] capillary;

at least one imager for imaging the GI tract and for imaging the [[interaction chamber]] capillary and for producing video signals thereof; and

a transmitter for transmitting the video signals to a receiving system.

39. (Currently amended) The capsule according to claim 38 wherein the capsule comprises two opposing ends and wherein the capsule comprises two [[interaction chambers]] capillaries and two imagers and wherein the [[interaction chambers]] capillaries and the imagers are each positioned at an opposing end of the capsule.
40. (Currently amended) A device comprising a transmitter for transmitting video signals, said transmitter operable with a system, said device comprising:
- at least one [[interaction chamber]] capillary that is configured in an autonomous device capable of passing through a body lumen for containing a sample from the GI tract environment, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;
 - at least one illumination source for illuminating the body lumen and the [[interaction chamber]] capillary;
 - at least one imager for imaging the body lumen and for imaging the [[interaction chamber]] capillary and for producing video signals thereof, said video signals being transmitted by the transmitter.
41. (Previously presented) A device comprising a transmitter according to claim 40 wherein the transmitter transmits the video signals to a receiving system external to the body lumen.
42. (Currently amended) A system comprising a receiver for receiving video signals, said system comprising:
- at least one [[interaction chamber]] capillary that is configured in an autonomous device capable of passing through a body lumen for containing a sample from the GI

tract environment, said [[interaction chamber]] capillary comprising at least one indicator for reacting with the sample for generating optical changes in the [[interaction chamber]] capillary;

at least one illumination source for illuminating the body lumen and the [[interaction chamber]] capillary;

at least one imager for imaging the body lumen and for imaging the [[interaction chamber]] capillary and for producing video signals thereof; and

at least one transmitter for transmitting the video signals, said video signals being received by the receiving system.

43. (Currently amended) A capsule comprising:

at least one [[interaction chamber]] capillary for containing a sample while in vivo, said [[interaction chamber]] capillary including at least one indicator disposed therein to react with the sample and to generate optical changes in the [[interaction chamber]] capillary;

at least one illumination source; and

at least one optical detector.

44. (Currently amended) The capsule of claim 43, wherein the illumination source is to illuminate the [[interaction chamber]] capillary.

45. (Currently amended) The capsule of claim 43, wherein the optical detector is to detect optical changes occurring in the [[interaction chamber]] capillary.

46. (Previously presented) The capsule of claim 43, comprising a transmitter.

47. (Previously presented) The capsule of claim 43, comprising a micro-pump.

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48. (New) An autonomous device configured for being capable of passing through a body lumen, the device for determining in vivo conditions, the device comprising:

at least one interaction chamber for containing a sample while in vivo, said interaction chamber including at least two openings and an indicator for reacting with the sample for generating optical changes in the interaction chamber;

an illumination source; and

an optical detector.

49. (New) The autonomous device according to claim 48, wherein the optical detector is an imager.

50. (New) The autonomous device according to claim 48, wherein the device is a capsule.

51. (New) The autonomous device according to claim 48, comprising a transmitter.

52. (New) The autonomous device according to claim 48, comprising a micro-pump.